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## THE INTENSITY OF CULTIVATION

### SUMMARY

Question of intensity of culture an old one; never purely objective, 646. — Ability of the entrepreneur the limiting factor, 647. — The problem of intensity of culture stated in one of three ways: entrepreneurship fixed, land fixed, capital fixed, 648. — An experiment may be made with something less than the whole amount of land or capital, 653. — An illustration of the difficulties of the trial method, 654. — Income will be alike for all at the margin, 657. — Intensity varied within a given year, 657. — Social aspect of intensity of culture, 658. — Effect of change of price of product or intensity of culture, 659. — Payment of rent induces intensity of culture, 661. — Effect of changes in wages or capital cost on intensity of culture, 662. — Intensity will vary inversely with these costs, 662.

THE question of intensity of cultivation is as old as economics, yet it forever keeps coming up for more definite statement, or for a statement showing how the proper degree of intensity is visualized and approached. The most usual way out of the difficulty is to assume the most advantageous combination of land, labor and capital, and let it go at that. No doubt there always is a best combination, just as there is a best mixture of paints for the best effect, and this truism may easily recall the famous reply of Whistler that he always mixed his paints with brains. It is exactly this requirement that makes the formula so difficult for intensity of culture. The problem is never purely objective. It is not as simple as making the proper combination of air and gasoline in a mixture for power, since it makes no difference who adjusts the carburetor so long as it

is properly adjusted, the results are the best obtainable. On the contrary, in the combination of land labor and capital for producing the best results the personality of the man making the combination makes all the difference imaginable in the results. A gasoline engine in the hands of a novice may do substantially all it is capable of doing tho planned, adjusted, and repaired by parties not immediately concerned with its work. A farm can hardly be so standardized and managed. The work of the entrepreneur in agriculture is bound up in the operations almost as though he were a vital part of an organism; he must be the active, indeed, the indispensable agent.

Whether or not the return to the entrepreneur is viewed as a part of the larger category of wages, it must be recognized that the limiting factor *par excellence* is the ability of the entrepreneur. It makes no difference whether the limits are found in the unwillingness of the entrepreneur to undergo greater strain; whether he reaches the point of losing money; or whether he prefers a certain measure of enjoyment in place of further work. Any one of these conditions means that he is not in a position or attitude for further expansion. In other words, the point of diminishing returns has been reached and the income of each individual is thereby circumscribed; likewise social income is, because of this fact, held within certain positive bounds. The proper proportioning of the factors of production, which is the means of arriving at the proper degree of intensity of culture, involves four variables. Since no problem can be discussed with four variables it is necessary to assume metes and bounds for all but one at any given time. For convenience the ability of the entrepreneur, which no doubt is more or less elastic, may be taken as fixed. It is by all means the most

definitely fixed of any of the factors involved. There is a limit beyond which an entrepreneur does not care to go in the effort to increase his income. In many cases it is a limit beyond which his banker refuses to carry him. But whether it be the limit set by the banker; by his own courage, or lack of courage; by his desire for leisure, for avocations; or by sheer managing ability; it must in some manner reach the limit beyond which it will not for the time being go. Thus the entrepreneur himself is the most definitely limiting factor in production. His managing ability may be viewed as fixed.

For convenience it will be desirable to put capital and labor into one category. From the entrepreneur's standpoint they are both reducible to a money unit. This combined factor is subject to variations which affect intensity of culture, but they may be waived for later consideration.

The intensity of culture problem may be stated in three ways, or rather it must be viewed from three standpoints:

- (1) It may be assumed that entrepreneurship is fixed and that capital and land are applied to it in varying amounts.
- (2) Land may be viewed as fixed and capital varied, entrepreneurship being taken for granted.
- (3) Capital may be fixed and land varied, entrepreneurship still being assumed.

Added to these three points of view there may still be a fourth, which is however, hardly more than a corollary to the second and third. It may, at least in practice, be necessary for the entrepreneur to treat both land and capital as variables while working out his proportions. This is hardly more than a detail, though possibly a very difficult one to handle.

Concerning the first point of view, it may very safely be stated that entrepreneurship is the most definitely limited of any factor involved. At the same time it is the one which is without visible proportions or tangible measurement. Were it not, however, just as genuinely limited as land or capital we should have numerous bonanza farms. In fact, so far as a given individual is concerned the most important of the limiting factors is that of his own managing ability. Were it not for this he could manage the agriculture of a township, a county, or a state.

But it may be objected that this is not the issue. Entrepreneurship may set the bounds of size of business, but not enter into the question of proportions of factors used. This at once raises the question as to how such an assumption can be made in view of the necessity of working out, on the part of each entrepreneur, the proportions which for him are best. How this can be done without using both land and capital, varying each alternately, then simultaneously is, to put it mildly, not obvious. Could the farmer, for example, determine by any possibility that he could do best with any particular amount of capital before discovering the amount of land with which to combine it, the problem would be simple both theoretically and practically. Since there appears to be no means by which this measurement of entrepreneurship can be made in advance of an experiment involving all factors, it will be as well to consider the second and third points of view before undertaking to say the final word, or even to draw any conclusions respecting the first count.

Land may be viewed as fixed. Very properly it may be objected that in a theoretical case land is never fixed, but may be varied in either direction, more or less. Even so, land is fixed in quantity for the majority of

farmers over appreciable periods of time. Perhaps we are not dealing with the majority of farmers, but only with the few who are alert enough to attempt an intelligent solution of the problem of intensity of culture. Very well, these too will in both theory and practice deal with quantities of land which are fixed during a given experiment. We may have, then, a fixed amount of land, not fixed by inertia, by heredity, or passing circumstance, but by the judgment of the entrepreneur. This may be merely a trial judgment, but even so it means that for the time the amount of land is fixed. Upon this amount of land the entrepreneur expends capital. The question is: How much? and the answer is easy. He will continue to expend capital until the last dollar just pays for itself. By so doing, assuming that he can get capital at commercial rates up to the limit of his ability as an entrepreneur, he will increase his income, and it is income he is after, total income, not any given rate on a limited sum. We may next inquire how this hypothetical farmer is to know that he is using the right amount of land. He will use his judgment, his observation, and his experience, and make trials with different amounts. That the more vital limitation is in ability to handle capital rather than land should be recognized, but capital cannot be managed except in connection with land. Moreover, the optimum amount of capital for any entrepreneur cannot be discovered by using wrong proportions since he could not decide whether the failure to arrive at satisfactory results was, in a given trial, due to poor management or a wrong combination. He will find out as he approximates the correct combination, and in doing so he will of necessity find the proper amount of land to be used with an amount of capital, yielding, on the enterprise so constituted, favorable returns. For any

serious trial the land must be fixed for the time, no matter how many times it be varied for subsequent trials. Thus land may be viewed as fixed, and in every trial the capital applied until the last increment just pays its cost. For a vast number of farmers the land is very firmly fixed in amount for years or for life. For the adaptable man it is fixed at different amounts until the most favorable acreage is discovered.

Capital may be viewed as fixed. No doubt this is the most elastic, and possibly the most satisfactory, supposition. It is not forgotten that the real limitation is managing ability, but the best measure of this ability is the capital which can be advantageously handled. To assume that capital really is fixed by circumstances and not ability is as crude reasoning as to assume land fixed. The able entrepreneur uses capital which he happens to have, or which he can borrow, or disposes of a surplus, exactly as is done in the case of quantities of land. He finds the amount which will yield him the largest income by taxing his entrepreneurship to the limit, by which process he comes, like everyone else, to the margin of his powers. He may, as a supermarginal farmer, be able to make his capital earn something well above average commercial returns. For instance, his curve of returns on his thousand dollar units may at its highest point rise well above that of his competitors. There is no reason why he might not stop his investments at a point where he was making, say 20 per cent. No reason except that he could make a larger absolute, not percentage, income by increasing his investments until the last increment just paid its cost, whereas it was assumed that in order to get the highest average a lesser amount was invested, and a return above the commercial rate secured from the last dollar.

However, it was decided that capital should be viewed as fixed. With this Rubicon safely passed, the campaign is easy. All the entrepreneur needs to do in order to find his best proportions is to add, or subtract, land until the last acre just pays its own cost. When this point is discovered he has his best proportions. The reason why this is not satisfactory is because the major premise will not bear analysis. It must be taken on faith, and having accepted the faith, the logic no longer gives trouble.

Just as with land, capital must be for a given time fixed. A farmer decides on the number of men and teams, and the amount of other equipment to be used in farming for a given year without, of necessity, deciding in advance the exact acreage of land. He arrives at a decision as to land, and after the year is over does his best to decide whether he had too much or too little. Should it seem that he is wide of the mark he will, in most cases, vary the amount of capital as well as the amount of land in projecting a new trial. To decide that his capital is right in amount but that the land is wrong means either that he has approached very nearly to the correct proportion or that he decides the one question independently of the other. But to know how much capital is best without trying it out is to know the solution of the problem in advance of the trial. This could be done in but one of two ways, viz., either by arriving at a decision based on experiments which gave results short of the optimum, or by solving the proportion riddle on a trial plot and carrying the result over to the whole. Neither hypothesis stands scrutiny.

It is, however, beyond all doubt true that so long as the capital remains fixed, whether right or wrong in amount, the entrepreneur will, in following his own



interests, apply land to it until the last increment just pays for itself. If the land bears a rent it will mean that the returns cover the expense of operation and the rent charge. If the land is free it will mean that the returns just cover the outlay for operation. No matter how stated, it amounts to the addition of land so long as there is a margin above cost and no longer.

Managing ability may be looked upon as fixed and land and capital both as variables. This is nothing different from the above discussion, but it is the real situation confronting the real entrepreneur. Should he attempt to add increments of land and capital he may do so by assuming the solution of the question at issue — the proportions. If he add units of first one and then the other he will show himself very human and adaptable, and will stand some chance of approaching the goal eventually. Each factor will be fixed for a time, but it will not remain fixed until the proper proportions have been found.

As a means of arriving at the optimum apportionment it may be interesting to attempt the experiment with something less than the whole, or fixed, amounts of either capital or land. That is to say, a trial, or laboratory experiment may be run in order to arrive at the correct proportions, on the basis of which the size of the business will be determined.

The question may very properly be raised as to the logic of these standpoints. For example, does the limitation of the entrepreneur's ability enter as a consideration into the question of the proportions of land and capital which are found best? It may be contended that whatever the optimum proportion as between land and capital no changes will, in this relationship, be contingent upon the ability of the entrepreneur to handle more or fewer units. However, it is a matter

of common observation that as the size of the enterprise varies up or down there is a corresponding, tho not necessarily proportional, change in the degree of intensity of culture. For example, suppose a farmer to find the best degree of intensity on eighty acres, but feels able to manage three eighties. Can he carry the same intensity over the additional two eighties? He can, provided his degree of intensity on the one eighty is adapted to the operation of the full-sized unit. To assume that such is the case is merely, and clearly, to beg the question. Finding the proper degree of intensity on the three eighties is the problem; but to find on a part of the whole enterprise what seems to be the best proportion is possible on paper only. This is true because the manager has no way of knowing, while running the experiment, that he is giving to it any exact proportion of his managing ability. For this reason he cannot, after trying out a part of his farm, including a corresponding part of his entire equipment and management, assume his proportions and calculate the size of the enterprise for succeeding years. That a manager may get suggestions from an experiment involving part of his farm is beyond argument. He may, and should be able to do so. But after all possible suggestions have been gained, the business must be tried out as a whole before either proportions or size can be known.

If it is possible to determine proportions by the laboratory method such possibility should be at least theoretically demonstrable. One may construct tables and diagrams showing how the problem is solved, but suppose, instead, an attempt should be made to visualize the operations of a real operator. Surely such a demonstration is fully as real. If it be supposed that the trial, a laboratory experiment as it were, is conducted on a small scale the troubles suggest themselves

at once. It is hard to find the right combination on the small area as a gauge for use on the larger area, or for that matter, since the experimental operations might just as well be on a large scale, it would be hard to adjust the duties of the entrepreneur so as to know how much less to operate, or how to operate it.

The above generalizations can be illustrated. Suppose a farmer wishes to determine the optimum combination with respect to the cultivation of corn. He tries a ten-acre field and by the correct combination of check plots finds it more profitable to plow seven inches deep, harrow four times, plant in drills instead of hills, cultivate three times instead of four times, and do one day's hand weeding per acre. Can he apply this to the area he thinks it best to attempt? It may easily happen that he plans to grow eighty acres of corn. The number of operations of each kind performed may be done on the larger field the same as on the smaller one. The plowing and harrowing may occasion no difficulty, but the chances are that it will be relatively harder to plow at the rather unusual depth, and to harrow at advantageous times. Of course, it may be shown theoretically that the larger fields are logical multiples of the smaller and that the work could be done in the same manner. In all probability this cannot be carried out. For instance, the small corn field was drilled, cultivated three times, and one day's hand labor used per acre. The larger field should be handled in the same manner, but the chances are that it will not be so handled. The weather will be more of a factor when the experiment assumes larger proportions. So will such matters as hiring the requisite quality and number of laborers. Should the farmer find that a given amount of labor and equipment could be used advantageously on twenty acres, and in that connec-

tion determine his proportion, it might be easy to multiply the labor and capital by four in getting ready for the eighty acres. This is substantially never done. An attempt is made to economize on equipment as the unit is enlarged, and inevitably the ability of the entrepreneur is a constant, and therefore not subject to automatic expansion and contraction to fit the different units operated. It will be found that cultivating corn three times is not the same under one condition as under other conditions. Perhaps the three cultivations were made at the most advantageous times, promptly after the corn was big enough to cultivate for the first time, when it needed cultivation subsequently, not when other work permitted it to be done. The hand labor of a day per acre found profitable on ten acres will again and again not be feasible on a hundred acres. Very well, leave it out in both cases. That is the point. The laboratory trial must be made to fit the condition of the full area, but the full area carries its own conditions and thereby determines to a degree its own proper intensity of culture. The trial area will actually work when it is big enough to absorb the whole available capital, and at this point we have, if it be accepted, to abandon the idea of predetermining proportions between, or among, factors.

If the foregoing reasoning is correct it will follow that all managers, marginal and supermarginal, large and small, will find no stopping place in applying land to capital until the last dollar just balances its cost; until the last acre of land just pays for itself; and until the proportion is such that land and capital costs are alike in returns per value unit. The average returns per dollar will be high for some, low for others. How high they will go depends on the ability of the manager. The lower limit is commercial return so long as a

deficit is not made up out of wages. But all, from the best to the poorest, will not escape the necessity, and the privilege, of investing until the last increment brings in no added returns above the cost, and at these margins all men are equal. Of proportions there may be no two alike. Of average incomes no two alike. But for each there will be a best proportion and he will find it by using all of his ability as an entrepreneur, and alternately fixing capital and land, proceed until neither separately nor jointly can his income be augmented by further additions. Each has balanced at the margin where cost and income are equal.

The discussion thus far has assumed the point of view of a business projected for at least a year in advance. During each year the problem is bound to assume different aspects. After every plan has been made as carefully as possible and the season has advanced to the point where acreages cannot profitably be changed there will be constant opportunities to invest more, or less, capital on a given project than was contemplated. The aggregate amount of capital used may be rigidly limited to a sum previously known. It may be all that is obtainable, but the chances are that no such definite bounds are set. Capital is usually obtainable with greater or less ease depending on the amount wanted. A certain amount is in the possession of the entrepreneur. Another amount is to be had at commercial rates with no trouble involved. Still more can usually be had at greater cost in both trouble and interest rate. The law of increasing cost operates as truly in the work of getting the use of capital which one does not own as in the creation of more capital in the form of goods. Thus far shalt thou go and no farther in the possession of capital involves the cost of the successive acquisitions. Thus the amount required for a

given season depends on the exigencies of the occasions as they arise.

The question may very properly be asked whether society is best served by the economic forces which constantly put the ablest farmer in possession of land, largely the best land, and as constantly push the inefficient out. This question becomes especially pertinent when it develops, as well it may, that small farmers are giving place to larger farmers. To the extent that this happens there will be fewer farmers, tho perhaps not fewer persons engaged in agriculture, on a given area of land. From the standpoint of production the case is not open to argument. Society is best served by farmers who will get the most out of the land, capital and labor employed. The only question at issue becomes, then, the relative social advantage of land ownership as opposed to whatever may displace it should inefficient farmers give way to the more efficient. This brings up other considerations. The intensity of culture which gives the best results to farmers viewed individually will give the best results socially so far as the ownership and use of land is concerned, judged by the standards of a healthy society. If from the standpoint of social pathology it should become necessary to use land as a prophylactic, economic considerations will of necessity be subordinated in the process. Until that time comes the impersonal workings of the law of diminishing returns, of which intensity of culture is a leading manifestation, is in harmony with the social good.

EFFECT OF CHANGE OF PRICE OF PRODUCE ON  
INTENSITY OF CULTIVATION

Every now and then a situation such as that occurring in the spring of 1917 confronts the farmer. The prices of what he had to sell rose rapidly while the costs of production remained relatively constant. Likewise, the rent of land remained about at the old level. What effect does such a situation have on the farmer who is always trying to adjust his land and capital in such a way as to get the most out of it for himself? Before attempting to answer the question it may be well to note the fact that the case is a temporary one, the inevitable tendency being always to return to the original proportions. However, the abnormal condition may last for a few years, and the tendency to return to the former balance may never be more than partially realized. That is to say, the abnormal situation may persist until it becomes a new normal. At all events, it is perfectly clear that disturbances such as the one noted above are constantly occurring in varying degrees. This one was extreme. The readjustments to meet such conditions may be so slight as to escape observation nine times out of ten; the tenth time they are likely to be conspicuous.

For convenience of presentation we will do a little violence to the facts as they confronted the farmer in 1917 and assume that prices of farm produce doubled while costs of labor and capital remained constant, rent also remaining constant. What was the best move for the farmer to make regarding the proportions of capital (including labor) and land used in his enterprise?

The following table will be useful in deciding the matter:

Expenses per acre	Value of crop per acre	Rent per acre	Returns per dollar of expense
\$6.00	\$11.00	\$5.00	\$1.00
10.00	15.10	5.00	1.01
15.00	20.30	5.00	1.02
17.50	22.67	5.00	1.01

Doubling the value of the produce the table becomes:

Expenses per acre	Value of crop per acre	Rent per acre	Returns per dollar of expense
\$6.00	\$22.00	\$5.00	\$2.83
10.00	30.20	5.00	2.52
15.00	40.60	5.00	2.38
17.50	45.34	5.00	2.31

Thus the optimum expenditure per acre has changed from \$15 to \$6. As a result a farmer with a capital of \$3000 to use will require 500 acres of land instead of 200, assuming the latter to be the most favorable amount before the change in price.

One more hypothesis may be of interest. Suppose the price of produce had fallen 50 per cent, other things remaining the same. The table would then appear:

Expenses per acre	Value of crop per acre	Rent per acre	Returns per dollar of expense
\$6.00	\$5.50	\$5.00	\$.083
10.00	7.55	5.00	.255
15.00	10.15	5.00	.344
17.50	11.335	5.00	.362

As was to be expected, the proportion most favorable is now \$17.50 per acre, a more intensive cultivation than the optimum in the first instance.

It may be objected that the above illustrations are based on a particular set of figures and that some other set might fail to show a similar result. This criticism is always in point when a generalization is attempted on the basis of an arbitrary instance. However, it is



not necessary to rely on any particular table. It may be assumed that the proposition has been proved, not here but by reasoning generally accepted, that free land will be farmed less intensively than land commanding a rent. From this accepted proposition it may be reasoned that the tables submitted above are of necessity correct — and that any change in figures while possibly concealing the truth cannot disprove the principle. The deductions would be somewhat as follows: the payment of rent compels greater intensity of culture. Hence, the intensity will increase though not necessarily in the same proportion as the increases in rent. Conversely if rent decreases, the intensity will decrease. Now an increase in the value of the product, with no other change occurring, is equivalent to a decrease in rent since a smaller portion of the gross yield is required to pay the rent than was required before the change in price. To decrease the quantity of produce needed for rent payment means a movement in the direction of free land and, therefore, a movement toward a more extensive culture. Should the price become extremely high the rent would become relatively reduced, even extremely low, and hence would lose most of its influence in the direction of intensive culture, the optimum degree of intensity decreasing with every rise in the price of produce, and conversely increasing with every fall in such prices.

The above discussion has been made as tho neither capital nor land were fixed in amount and the proportion only were the issue. The objection to this view has been discussed in the first part of this article, and hinges on the difficulty involved in apportioning the attention of the entrepreneur to a single acre, or to any group of acres short of the number included in the enterprise over which he is presiding.

# EFFECT OF CHANGE IN WAGES OR CAPITAL COST ON INTENSITY OF CULTURE

Another question is what will happen should wages rise or fall while prices of produce, interest and rent remain constant? It may be noted in passing that, where no rent is paid, should wages and interest rise or fall in unison that nothing will happen to the proportions in which capital, labor, and land will be combined. This is a contingency which will rarely occur. Thus while we united capital and labor into one term for convenient handling while discussing the degree of intensity in the first instance it is necessary to separate them when considering the changes that may follow a rise or fall in wages, or in capital costs, the two factors not acting the same in the matter of percentage changes. The occasion for such a discussion is abundantly illustrated in the recent experiences of farmers with the labor question. The following tables will bring the matter to light:

Labor	Expenses per acre		Gross returns	Return per dollar
	Capital	Total		
\$5.00	\$7.50	\$12.50	\$21.00	\$1.68
7.50	8.50	16.00	27.20	1.70
9.50	8.50	18.00	30.80	1.71
10.50	9.50	20.00	33.00	1.65

Increasing labor expenses by 100 per cent the table becomes:

\$10.00	\$7.50	\$17.50	\$21.00	\$1.20
15.00	8.50	23.50	27.20	1.12
19.00	8.50	27.50	30.80	1.12
21.00	9.50	30.50	33.00	1.08

As shown by the table the increase in wages results in a movement toward a more extensive culture. In actual practice the case would not be as simple as this, or at least the simplicity, if there should be such, would

take on a different aspect. The farmer confronted with the higher wages is bound to think of a way to escape other than the one indicated in the second part of the table which involves getting more land. He will try to escape by way of a substitution of capital for labor. He will buy a gang plow, a tractor, a milking machine, or more haying tools, with the hope of keeping up his intensity of culture without incurring the added expense resulting from the higher wages. In some cases he may succeed in maintaining his former intensity judged by results while moving toward more extensivity judged by the application of labor and capital to land in terms of dollars per acre.

The changes in prices of produce, wages, and capital cost will always, respectively, have an effect on the desire for the other factors, and hence change the price of these other factors. The result will be a new balance which is likely to be similar to, though not identical with, the previous balance before the disturbance came. The importance of the immediate effect may be appreciated when it is remembered that more or less occasion for a readjustment no doubt takes place yearly, or even at much more frequent intervals.

A change in the cost of capital goods, or in interest rates, where wages do not change correspondingly, will bring about changes in intensity of culture similar to those noted in the above discussion of changes due to variation in wages. If capital goods cost more, fewer, relatively, will be used; if they cost less, more will be used. Thus intensity of culture will vary conversely with these costs.

Whether or not rent is to be counted as a cost is a disputed point. No attempt will be made here to clear the matter up. In any case it is a cost to the individual who buys land as a part of his equipment for producing

farm crops. Under these circumstances, viewing rent as a charge against the farming business — a current cost comparable to interest and wages — the case of intensity of culture assumes a new aspect. Should the labor-capital cost rise, or fall, in some proportion, as by twenty-five, or fifty per cent, rent remaining constant, the point of optimum returns will be affected. This must obviously follow since the labor-capital cost plus the constant rent will bear a varying relation to the income obtained by the different degrees of intensity of culture after the former has been increased or diminished. Thus in the first part of the table following the best results were obtained with the intensity indicated in the fourth line, while after the rise in labor-capital costs the next less intensive application is the best.

Labor-capital cost	Gross returns	Rent per acre	Returns per dollar expended
\$14.00	\$35.00	\$10.00	\$1.46
15.00	37.00	10.00	1.48
16.00	39.00	10.00	1.50
17.00	40.90	10.00	1.515
18.00	41.50	10.00	1.48

Increasing the labor-capital cost by 50 per cent:

\$21.00	\$35.00	\$10.00	\$1.129
22.50	37.00	10.00	1.138
24.00	39.00	10.00	1.147
25.50	40.90	10.00	1.124
27.00	41.50	10.00	1.121

Not only does the rise in the cost of labor and capital result in less intensive farming as seen by the rise from the fourth to the third line of the above table, but the same influence is seen in the results of the first and second lines. The swing toward the less intensive is manifest in these as well as in the subsequent lines, there being a reduced advantage in each step toward the more intensive.

The results found by taking particular figures for the demonstration may be open to criticism. It is true the relations of the figures in the fourth column may be varied indefinitely by varying the relations of the numbers chosen for columns one and two. In some combinations the trend may be obscured, but in no case will it appear to lie positively in the opposite direction.

It is not forgotten that in these discussions concerning the results of changes in prices and costs on intensity of culture the solution of the intensity of culture riddle, as a practical problem, cannot be worked out as a mere arithmetical calculation. Even so, the influences of these supposed changes in costs would seem to be in the directions indicated.

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